What is claimed is:

1. A method for inspecting a multiple die reticle that is used with an optical exposure system under a set of exposure conditions, said multiple die reticle including at least a first die and a second die, said method comprising:

acquiring a plurality of aerial images of said reticle using a transmitted light, said plurality of aerial images being acquired within a process window of said exposure system and using said set of exposure conditions; said plurality of aerial images including a first plurality of aerial images of said first die and a second plurality of aerial images of said second die; and

comparing said first plurality of aerial images of said first die and said second plurality of aerial images of said second die to detect variations in line width in said first die.

2. The method of claim 1, wherein prior to said comparison step, said aerial images of said first and said second dies are transformed to simulate a behavior of a exposure system and the photoresist.

3. The method of claim 1, wherein said acquired aerial images of said reticle are magnified in relation to corresponding images created on photoresist by said optical exposure system using said reticle.

4. The method of claim 1, wherein each of said first plurality of aerial images of said first die corresponds to a different focal condition; and each of said second plurality of aerial images of said second die corresponds to a different focal condition.

5. The method of claim 4, wherein different focal conditions represented in said first and second pluralities of aerial images expands the focus dimension of the process window of the exposure system.

6. The method of claim 1, wherein there are three aerial images in said first plurality of aerial images, and three aerial images in said second plurality of aerial images.

7. The method of claim 1, wherein:

a first aerial image of said first plurality of aerial images of said first die is in focus;

a second aerial image of said first plurality of aerial images of said first die is out of focus in a positive direction; and

a third aerial image of said first plurality of aerial images of said first die is out of focus in a negative direction.

8. The method of claim 7, wherein:

a first aerial image of said second plurality of aerial images of said second die is in focus;

a second aerial image of said second plurality of aerial images of said second die is out of focus in a positive direction; and

a third aerial image of said second plurality of aerial images of said second die is out of focus in a negative direction.

9. The method of claim 1, further comprising:

acquiring an image of said reticle using a reflected light; and

using said acquired image of said reticle and said plurality of aerial images of said reticle to detect defects in said reticle.

10. The method of claim 9, wherein said reflected light is produced by illuminating said reticle using a dark field illumination system.

11. The method of claim 1, further comprising displaying results of said comparison in a graphic form.

12. The method of claim 1, further comprising using results of said comparison to produce a map of said variations in said line width of said first die.

13. The method of claim 1, wherein said transmitted light is provided using a pulsating light source.

14. The method of claim 13, wherein said pulsating light source is a pulsating laser.

15. The method of claim 9, wherein said reflected light is provided using a pulsating light source.

16. The method of claim 15, wherein said pulsating light source is a pulsating laser.

17. The method of claim 1, wherein said acquiring said plurality of aerial images comprises placing said reticle on a stage and moving said stage in a continuous manner.

18. The method of claim 13, wherein said acquiring said plurality of aerial images comprises placing said reticle on a stage and moving said stage in a continuous manner.

19. The method of claim 15, wherein said acquiring said plurality of aerial images comprises placing said reticle on a stage and moving said stage in a continuous manner.

20. A method for inspecting a reticle that is used with an optical exposure system under a set of exposure conditions, said method comprising:

acquiring a plurality of aerial images of said reticle using a transmitted light, said plurality of aerial images being acquired within a process window of said exposure system and using said set of exposure conditions;

acquiring an image of said reticle using a reflected light; and

using said acquired image of said reticle and said plurality of aerial images of said reticle to detect defects in said reticle.

21. The method of claim 20, wherein said acquired images of said reticle are magnified in relation to corresponding images created on photoresist by said optical exposure system using said reticle.

22. The method of claim 20, wherein each of said plurality of aerial images of said reticle corresponds to a different focal condition.

23. The method of claim 20, wherein said transmitted and said reflected light are provided using a pulsating light source.

24. The method of claim 23, wherein said pulsating light source is a pulsating laser.

25. The method of claim 20, wherein said acquiring said plurality of aerial images comprises placing said reticle on a stage and moving said stage in a continuous manner.

26. The method of claim 23, wherein said acquiring said plurality of aerial images comprises placing said reticle on a stage and moving said stage in a continuous manner.

27. An apparatus for inspecting a multiple die reticle that is used with an optical exposure system under a set of exposure conditions, said multiple die reticle including at least a first die and a second die, said apparatus comprising:

a scanner for acquiring a plurality of aerial images of said multiple die reticle under said set of exposure conditions; said plurality of aerial images of said

reticle comprising a first plurality of aerial images of said first die and a second plurality of aerial images of said second die; and

an image processing module for detecting variations in line width of said first die of said reticle using said first plurality of aerial images of said first die and said second plurality of aerial images of said second die of said multiple die reticle.

28. The apparatus according to claim 27, wherein said scanner comprises a plurality of cameras for acquiring said plurality of aerial images of said multiple die reticle.

29. The apparatus according to claim 28, wherein said plurality of cameras comprises:

a first camera for acquiring a first image of said plurality of aerial images of said multiple die reticle;

a second camera for acquiring a second image of said plurality of aerial images of said multiple die reticle; and

a third camera for acquiring a third image of said plurality of aerial images of said multiple die reticle.

30. The apparatus according to claim 29, wherein:

said first camera is in focus;

said second camera is out of focus in a positive direction; and

said third camera is out of focus in a negative direction.

31. The apparatus according to claim 28, wherein:

said scanner further comprises a light source for illuminating said reticle with an illuminating light; and

said plurality of cameras are sensitive to said illuminating light.

32. The apparatus according to claim 31, wherein said light source is a pulsating light source.

33. The apparatus according to claim 32, wherein said pulsating light source is a pulsating laser.

34. The apparatus according to claim 26, further comprising a stage on which said reticle is placed, and means for moving said stage in a continuous manner.

35. The apparatus according to claim 32, further comprising a stage on which said reticle is placed, and means for moving said stage in a continuous manner.

36. The apparatus according to claim 26, wherein said scanner further comprises:

a transmission light illumination system for illuminating said reticle;

a dark field illumination system for illuminating said reticle; and

an optical system for collecting light emerging from said reticle and creating aerial images of said reticle in said first, said second, and said third cameras.

37. The apparatus according to claim 36, wherein said optical system of said scanner further comprises a numerical aperture diaphragm for reproducing said set of exposure conditions.

38. The apparatus according to claim 36, wherein said dark field illumination system is positioned adjacent to said optical system.

39. The apparatus according to claim 36, wherein said dark field illumination system is coaxial with said optical system.

40. The apparatus according to claim 36, wherein said dark field illumination system and said transmission light illumination system are positioned on opposite sides of said reticle.

41. An apparatus for inspecting a reticle that is used with an optical exposure system under a set of exposure conditions, said apparatus comprising:

a scanner for acquiring a first plurality of aerial images of said reticle in a transmitted light under said set of exposure conditions and a second plurality of aerial images of said reticle in a reflected light; and

an image processing module for detecting defects in said reticle using said first plurality of aerial images of said reticle and said second plurality of aerial images of said reticle.

42. The apparatus according to claim 41, wherein said scanner further comprises:

a transmission light illumination system for illuminating a first face of said reticle;

a dark field illumination system for illuminating a second face of said reticle; and

an optical system for collecting light emerging from said reticle and acquiring said first and said second pluralities of aerial images of said reticle.

43. An apparatus for inspecting a multiple die reticle that is used with an optical exposure system under a set of exposure conditions, said multiple die reticle including at least a first die and a second die, said apparatus comprising:

a light source;

transmission light illumination means for illuminating said reticle;

optical means for producing a plurality of magnified aerial images of said reticle under said set of exposure conditions, said optical means having a numerical aperture diaphragm for reproducing said set of exposure conditions;

imaging means for acquiring said plurality of magnified aerial images of said reticle; said plurality of magnified aerial images of said reticle comprising a first plurality of aerial images of said first die and a second plurality of aerial images of said second die; and

image processing means for analyzing a condition of said reticle using said first plurality of aerial images of said first die and said second plurality of aerial images of said second die.

44. The apparatus according to claim 43, wherein said light source is a pulsating light source.

45. The apparatus according to claim 44, wherein said pulsating light source is a pulsating laser.

46. The apparatus according to claim 43, further comprising a stage on which said reticle is placed, and means for moving said stage in a continuous manner.

47. The apparatus according to claim 44, further comprising a stage on which said reticle is placed, and means for moving said stage in a continuous manner.

48. The apparatus according to claim 43, further comprising a dark field illumination means for illuminating said reticle.

49. The apparatus according to claim 43, wherein said transmission light illumination means and said dark field illumination means are positioned on opposite sides of said reticle.

50. The apparatus according to claim 43, wherein said imaging means further comprises a plurality of cameras for acquiring said plurality of magnified aerial images of said reticle when the reticle is illuminated by said transmission light illumination means.

51. The apparatus according to claim 50, wherein said plurality of cameras comprises:

a first camera for acquiring a first image of said plurality of magnified aerial images of said reticle;

a second camera for acquiring a second image of said plurality of magnified aerial images of said reticle; and

a third camera for acquiring a third image of said plurality of magnified aerial images of said reticle; said first, said second and said third aerial images of said reticle being respectively acquired by said first, said second and said third cameras when the reticle is illuminated by said transmission light illumination means.

52. The apparatus according to claim 51, wherein:

said first camera is in focus;

said second camera is out of focus in a positive direction; and

said third camera is out of focus in a negative direction.

53. The apparatus according to claim 52, wherein:

said first camera acquires a fourth image of said plurality of magnified aerial images of said reticle, said fourth image being acquired when said reticle is illuminated by said dark field illumination system.

54. The apparatus according to claim 53, wherein said image processing means uses said fourth image to identify defects in said reticle.

55. The apparatus according to claim 43, further comprising a post process and review means for displaying said condition of said reticle in a graphical form.

56. The apparatus according to claim 51, wherein:

a wavelength of the light source is identical to the wavelength of the exposure system; and

said first, said second, and said third cameras are sensitive to said spectrum of said laser light source.

57. The apparatus according to claim 43, further comprising a homogenizer disposed in the vicinity of said transmission light illumination means for reducing speckle resulting from use of said light source;

58. A method for determining a process window for exposure of a multiple die reticle by an optical exposure system, said reticle to be exposed by said optical exposure system under a set of exposure conditions, said method comprising steps of:

acquiring a plurality of aerial images of said reticle using a transmitted light under said set of exposure conditions; and

using said acquired aerial images to determine said process window of said optical exposure system.

59. The method of claim 58, wherein:

a first image of said plurality of aerial images of said reticle is in focus;

a second image of said plurality of aerial images of said reticle is out of focus in a positive direction; and

a third image of said plurality of aerial images of said reticle is out of focus in a negative direction.

60. The method of claim 58, wherein said plurality of aerial images of said reticle and said image of said reticle are acquired using a pulsating light source.

61. The method of claim 60, wherein said pulsating light source is a pulsating laser.

62. The method of claim 58, wherein said acquiring said plurality of aerial images comprises placing said reticle on a stage and moving said stage in a continuous manner.

63. The method of claim 60, wherein said acquiring said plurality of aerial images comprises placing said reticle on a stage and moving said stage in a continuous manner.